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4.—Description of a New Fish of the Family Galaxiidae from
Western Australia

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A new species of the family Galaxiidae from the south-west of Western Australia is described. It sharply differs from other members of the family in shape of the fins, number of fin-rays, and particularly in having scales on the body. The habitat is a very small creek in heavy forest.

Type of the genus:

Lepidogalaxias salamandroides species nova*

D 5-6, A 11-12, P 10-12, V 4, C 12-15, scales or scale-rudiments about 75-80 in a longitudinal line.

A slender Galaxiid of apparently small size; anterior part of the body more or less cylindrical, posterior part, behind implantation of D and A very much compressed. Head 4.3 to 5.0 in standard length; snout blunt, shorter than eye, about 0.5 to 0.7 of eye diameter; eyes small, 4.2 to 4.7 in head, in anterior part of head; nostrils in front of eye, rather close together, the anterior nostril near the margin of the upper lip, posterior nostril in front of middle of eye, above and posterior to anterior nostril; mouth small, cleft well below eye, maxilla reaching to below posterior half of eye, lips slightly fleshy; teeth uniserial in both jaws, no canines; a single series of comparatively large teeth on vomer and entopterygoids; tongue free, slender, evenly rounded anteriorly and as far as I could ascertain toothless; opercles large, free from isthmus, their posterior margins evenly rounded, soft and flexible (in the figure it looks as if there is a dent in the opercle, but this is only seemingly so; it is the place where the hind border of the opercle is lifted up by the slightly swollen base of the pectoral fin).

Scales. Fairly distinct on the sides of the body, less distinct dorsally and probably absent from the under surface; head and breast naked. Originally I thought that the sides had only regularly arranged dermal folds, but closer examination revealed that each fold consists of a very thin cycloid scale, covered by skin.

Lateral line present, but indistinct, particularly so on the posterior part of the body.

Dorsal fin slender and long, pointed with a very short base, consisting of five or six undivided rays, of which the third is the longest, implanted well backwards, with its origin over the anus.

Anal fin comparatively short and pointed, with a fairly long base, consisting of six well developed rays, the fourth of which is the

* The specific name is given because of a striking superficial similarity the species has to some smaller newts.

In July, 1959, the Western Australian Museum received from Mrs. E. Godridge of Shannon River, in the south-west of Western Australia, a small fish for identification. In an accompanying letter Mrs. Godridge wrote that the specimen had been caught in a creek near Shannon River and that she was forwarding it because it was unfamiliar to her.

It was at once evident that the specimen belonged to the Galaxiidae or some closely related group, and that it could not be referred to any species known from Western Australia. Owing to my absence from Perth the matter had to rest for a while, but later Mrs. Godridge was contacted again with the result that in October 1959, together with Miss K. C. A. Vollprecht and Miss H. Williams (both of the staff of our museum), I went to Shannon River, where Mrs. Godridge took us to the locality where she had caught the fish. Several hours of work resulted in the four of us obtaining, between ourselves, five additional specimens.

The material evidently represents a very distinct new species that will be described below.

The greatest credit is due to Mrs. Godridge, who not only obtained the first specimen in a habitat where few people would search for fish, but who moreover realised at once that it was something unusual, preserved it, and sent it to the Western Australian Museum.

Though I favour large genera wherever possible, the species presents such characters that it seems impossible to place it in any of the extant genera of the Galaxiidae.

Genus *Lepidogalaxias* genus novum

Characterised by the presence of rudimentary scales. Scales are otherwise unknown in the Galaxiidae. Further by the small number of rays in D and V, and by the great length of these rays. All fin-rays, with the exception of an odd one in the caudal fin, simple. Other characters are given in the species diagnosis.

Western Australian Museum, Perth, Western Australia.

longest, and five or six small and thin rays, which are implanted close together but remain perfectly discernible as separate units. Anterior margin of A just behind anus and very slightly posterior to anterior margin of D.

Pectoral fins small, rounded, not reaching half way to implantation of ventrals, with ten to twelve undivided rays, base concealed under dermal flap of opercle, slightly ventral in position (distance from dorsal outline about twice distance from ventral outline).

Ventral fins with only four very long and slender undivided rays, the third of which is the longest and reaches beyond the anus; fins therefore strongly pointed and filamentous towards the tips; implantation in anterior half of the body, slightly farther back than two-fifths of the standard length.

Caudal fin rather elongate, consisting of twelve to fifteen rays, undivided or an occasional one divided, the middle rays longest, so that the tail looks evenly rounded or even slightly pointed (as is the case in the type specimen, see Fig. 1a).

From D and A backwards to C run dermal keels which, however, are not nearly as highly developed as in some other species of the family.

Colours. As regards coloration, the material at hand can be divided in two groups; these differ also in body shape.

The first group which includes the type and two other specimens, is brownish above, pale below, and has a very distinct broad longitudinal band, dark greyish blue in colour, along the sides, and two lines of the same colour on the head; one from the snout, through the dorsal part of the eye on to the upper margin of the opercle, the second from the postero-ventral part of the eye backwards. Apart from that, there are a few dark spots, concentrations of melanophores, on the head and irregularly distributed over other parts of the body.

The second colour type, to which the other three specimens belong, is mainly distinguished by the fact that the striking bluish colour is entirely absent; the band along the sides is less clear, at places interrupted, and brownish grey in colour; in one specimen it consists of a double series of brownish grey dots only, which makes the fish look strikingly different from the first colour type. The fishes of this colour are very much thinner than those of the first type, also their fins, particularly the tails, are strongly worn. I regard it as likely that the first colour type belongs to fishes in nuptial coloration, and that the second, duller type, is found in fishes after spawning. On dissection of a specimen of this group, I failed to locate the gonads which must have been small.

The type specimen, but none of the others, has a rodlike tubular organ protruding from the anus (Fig. 1a). On dissection this specimen was found to be a female, the abdominal cavity is filled with large eggs, each of over a millimetre in diameter. I preferred to leave the eggs *in situ* so that an exact count could not be made, but they number about twenty. It is possible that the rodlike tubular organ is an ovipositor. Several other specimens, at least one of which is a male, have a much more compli-

cated structure that can be described as follows (Fig. 1b and c): just before the anal pore the skin of the belly ends in two small papillae; behind the anus the anal fin is almost entirely encased in two dermal flaps (without removing at least one of these flaps it is impossible to count the anal rays as they are entirely concealed); two other dermal flaps also find their origin just behind the anus, and partly cover the first set of dermal flaps, partly cover the lower part of the sides of the body, above the anal fin. The function of these structures is as yet obscure to me.

I have been unable to find any trace of mucous pores, usually so conspicuous in Galaxiidae, on the upper surface of the head.

Type, a female specimen of 60 mm total length, 49 mm standard length, collected in July 1959 by Mrs. E. Godridge in a tiny creek about six miles E.N.E. of Shannon River. W.A.M. regd. no. P. 4887.

Paratypes, five specimens of 37, 48, 50, 54, 55 mm total length and 31, 39, 44, 47 and 47 mm standard length, collected on October 3rd 1959 by Mrs. E. Godridge, G. F. Mees, Miss K. C. A. Vollprecht and Miss H. Williams, at the same locality. Three specimens W.A.M. regd. no. P 4888, two specimens in the Leiden Museum.

Distribution. Known from the type locality only.

Habitat. Type and paratypes were obtained in a very small creek in heavy forest of mixed Karri and Jarrah (*Eucalyptus diversicolor* F. v. Muller and *E. marginata* J. E. Smith) about six miles E.N.E. of Shannon River (Plates I and II), on a place where the creek crossed a rarely used car-track. The creek was on an average about 30 cm wide and 5 cm deep; the creekbed was largely filled with *Eucalyptus* leaves, especially on those places where the creek was slightly wider and deeper. It was by taking out this layer of leaves mixed with some mud, and carefully going through it, that we obtained our specimens. Even then they were not easy to find as they did not wriggle. Not a single specimen was seen free swimming.

The only other aquatic animals found in the creek were large numbers of *Cherax preissii* Erichson, varying in size from 7 to 38 mm carapace length.

The creek is probably permanent, the water is cool and fairly rapidly flowing. The five fishes obtained in October were taken to the museum alive. They lived in an aquarium for a week, but after a fairly hot weekend were all found dead. I do not know whether lack of oxygen or the rise in temperature, or both these factors combined, caused their death. In the aquarium they would quietly rest on the bottom most of the time, usually concealed under some leaves, and always difficult to see.

Discussion. The discovery of a new species of the family Galaxiidae in Western Australia in itself is not surprising. When Regan (1906) published his revision he was able to list 14 species for Australia and Tasmania; in Munro's handbook (1957), 27 forms (24 species and 3 subspecies) are included, the majority of the additional species having been described during the last 25 years.

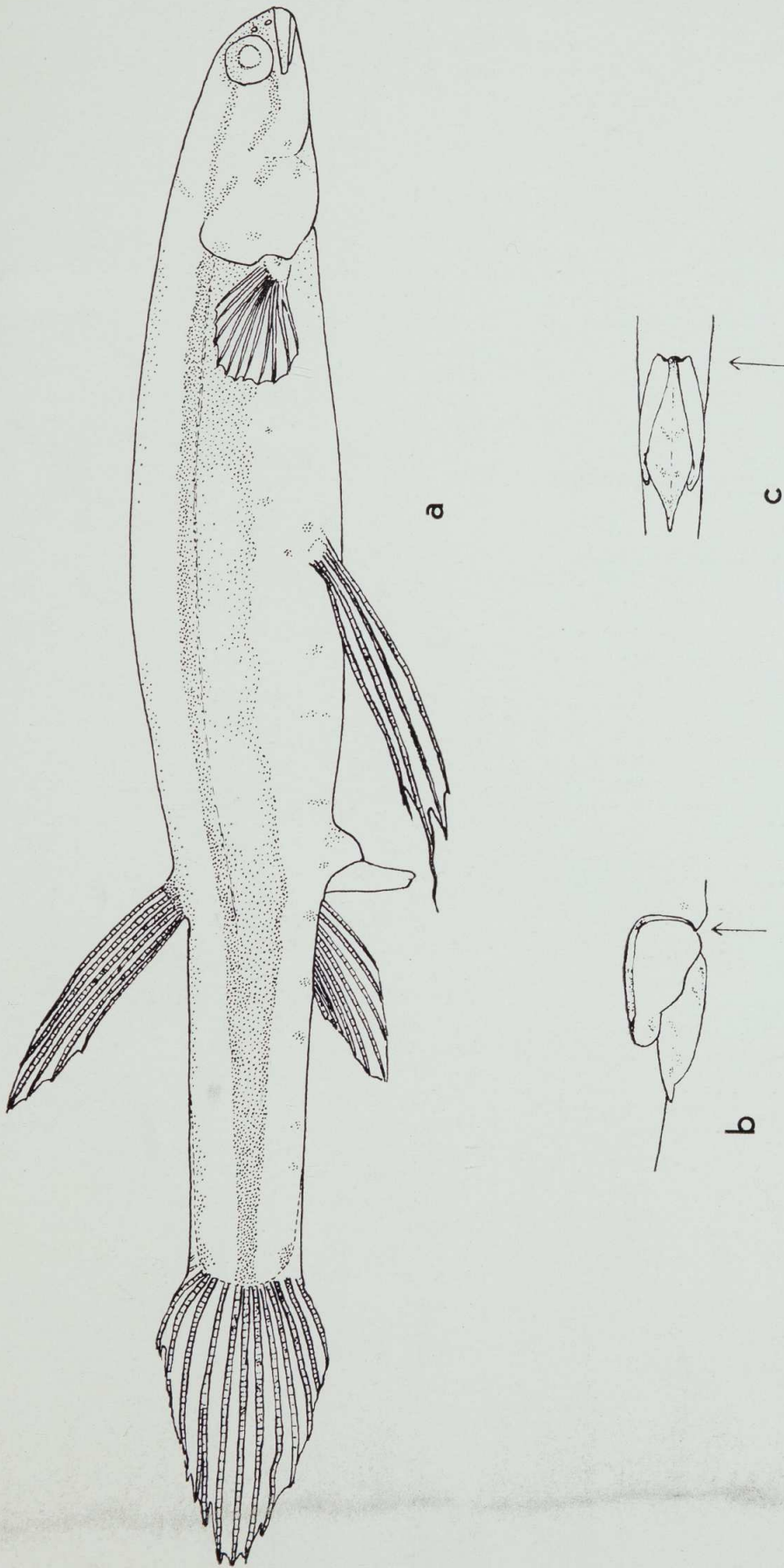


Fig. 1.—(a) *Lepidogalaxias salamandroides* ♀, type, 3 × nat. size. To avoid overcrowding of the figure, the scales have not been indicated.

(b) *Lepidogalaxias salamandroides* ♂, paratype of 44 mm standard length, anus and dermal flaps encasing anal fin, from right, 3 × nat. size. The arrow points to the anus.

(c) Same from below, 3 × nat. size.

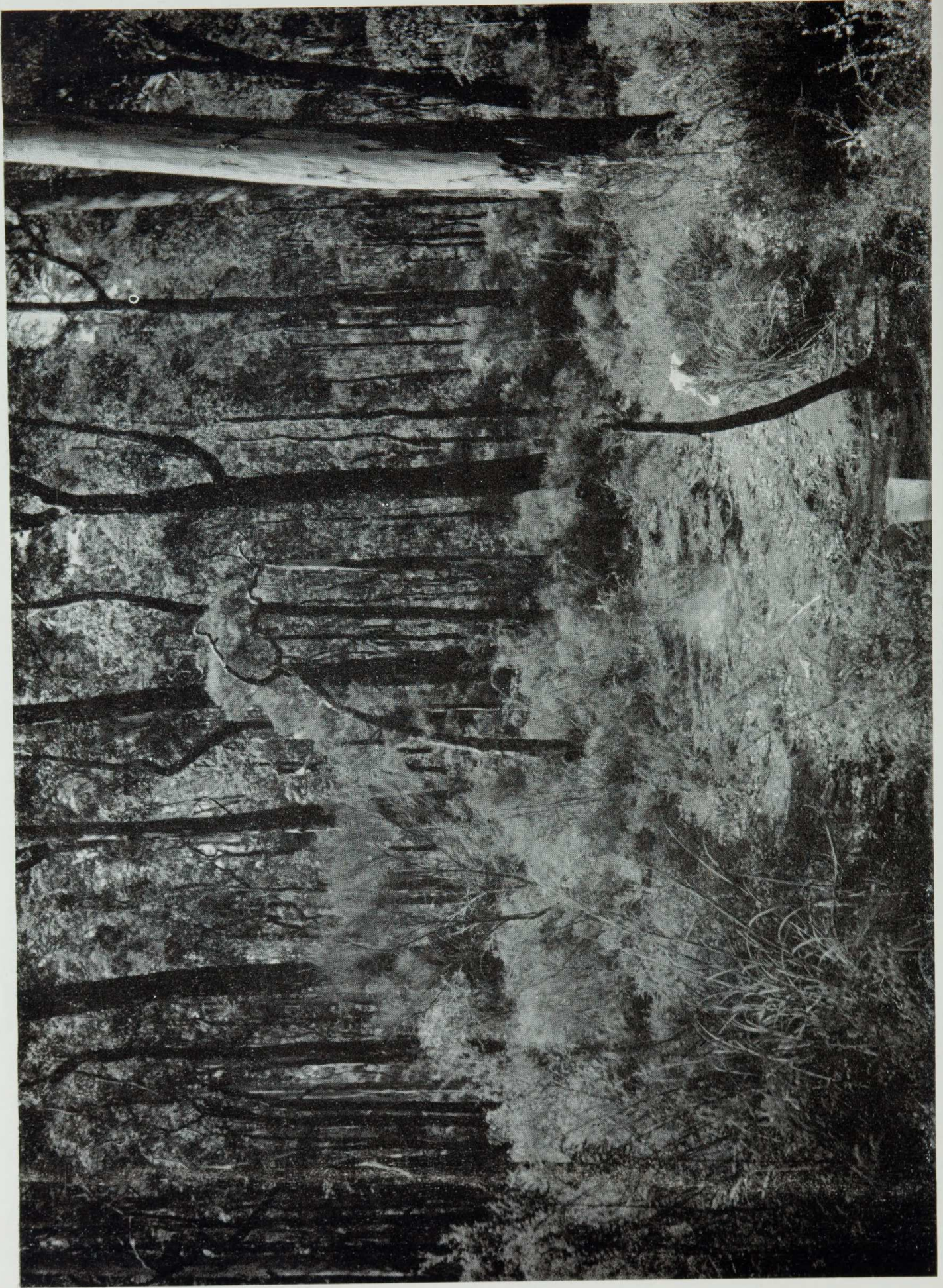


PLATE I
Type locality of *Lepidogalarias salamandroides*. The bucket stands in the stream. (Photograph: H. Williams.)



PLATE II

Type locality of *Lepidogalaxias salamandroides*. The footprint on the foreground gives an idea of the tinyness of the stream. (Photograph: H. Williams.)

From Western Australia, until quite recently, only one species, *Galaxias occidentalis* Ogilby (1899) was known; subsequently *Galaxias truttaceus hesperius* Whitley (1944) and *Galaxias pusillus nigrostriatus* Shipway (1953)* were added, both representatives of species known from the eastern states. In view of the richness of Tasmania and Victoria, one would expect even more species to be found in Western Australia. On the other hand there is little doubt that the unusual habitat has contributed to *L. salamandroides* not having been discovered earlier.

The aberrant nature of the species made me eager to have an independent opinion on it, and therefore two specimens were forwarded to the Leiden Museum where Dr. Boeseman examined them. Dr. Boeseman, in litt., 20. IX. 1960) agrees that the species belongs to the Galaxiidae, and that it deserves to be placed at least in a genus of its own, perhaps even in a separate subfamily. He kindly confirmed that scales are present, and suggested that I should examine other species of the family in search of scale rudiments. I have examined the three Western Australian species of *Galaxias* and found that they all have perfectly smooth skins without any trace of squamation.

* This species is nowadays usually placed in a separate genus *Brachygalaxias*, originally created for a South American species with five-rayed ventrals (Scott

1942, Stokell 1954, Munro 1957). However, Shipway described *G. p. nigrostriatus* as having V 1 + 5, which is six. Apart from the type the Western Australian Museum has only one specimen of this form, collected at Northcliffe near Albany on August 9, 1960, by Mr. W. H. Butler, no. P 4901, and it, also, has six-rayed ventrals. Stokell (1945) has already shown that the number of ventral rays is a character of doubtful systematic value, and for the moment I prefer not to give an opinion on the validity of *Brachygalaxias*.

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